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(12) # EUROPEAN PATENT APPLICATION

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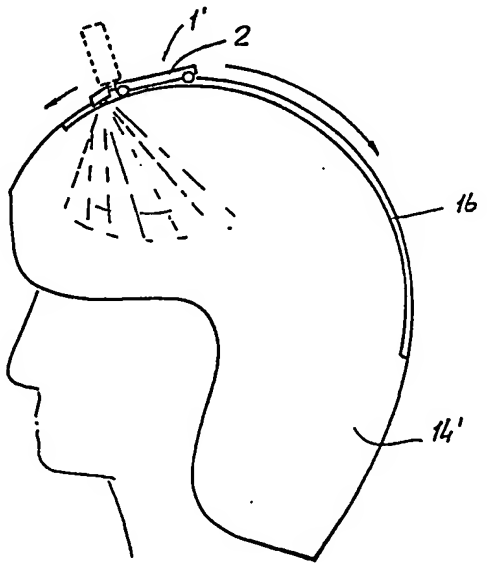
(54) **Radiating electromechanical apparatus for treating scalp against baldness.**

(57) There is disclosed a radiating apparatus, particularly designed for treating scalp against baldness, and essentially comprising a laser source (1) the output beam whereof is diffused, offset and conveyed, either directly or through optic fibers (5), at the overall extension of the patient scalp, the impinging points of the electromagnetic radiations being continuously changed.



EP 0 130 950 A2

The present invention relates to an electromechanical radiating apparatus for treating the scalp against baldness.

As it is known many persons are affected by a progressive baldness because of a plurality of not completely identified factors.

It is also known that there are presently available many products against baldness, which however have provided poor results.

Accordingly, the task of the present invention is to provide a radiating electromechanical apparatus effective to benefically affect the bulbs of the patient scalp.

Within that task, it is a main object of the present invention to provide such a radiating electromechanical apparatus which is effedtive to progressively stot the hair loss.

Another object of the present invention is to provide a radiating electromechanical apparatus which may be used in an easy and safe way.

According to one aspect of the present invention, the above task and objects, as well as yet other objects which will become more apparent hereinafter are achieved by a radiating electromechanical apparatus for treating scalp, characterized in that it comprises at least a laser source, the output beam whereof is diffused, offset and conveyed, either directly or through optical fibers, at the scalp overall extension

means being moreover provided for continuously varying the impinging points of the individual rays or beams on said scalp, in such a way as to maintain the direction of said beams perpendicular to said scalp.

Further characteristics and advantages of the radiating electromechanical apparatus according to the present invention will become more apparent thereinafter from the following detailed description of a preferred embodiment whereof, being illustrated, by way of example and not of limitation, in the accompanying drawing, where:

fig.1 is a schematic perspective view illustrating a containing casing of the subject apparatus;

fig.2 illustrates a first constructional diagram of that same apparatus;

fig.3 is a schematic view illustrating a movable assembly or "equipment" for supporting the laser source and a perforated bowl thereon there are welded the optic fibers conveying the electromagnetic radiations produced by the laser source itself;

figs.4, 5 and 6 illustrate possible applications of the laser source directly on a bowl suitably designed and equipped;

fig.7, in particular, illustrates the preferred direction assumed by the electromagnetic radiations at the output of the offsetting-diffusing device

associated with the laser source;

fig.8 illustrates a substantially semispherical helmet member with the optic fibers coupled through a focalizing connector;

fig.9 is a cross-sectional view illustrating the detail of a focalizing connector;

fig.10 is a cross-sectional exploded view illustrating a focalizing connector.

With reference to the figures of the accompanying drawings, the radiating electromechanical apparatus according to the present invention comprises, essentially, a laser source (1) enclosed in a suitable box-like body 2, of tubular (2) or flattened (2') shape, and energized by a suitable power supply (3).

The laser source which is preferably of the helium-neon type has its output coupled to an offsetting-diffusing device or member (4), effective to diffract the electromagnetic radiation into a plurality of beams and to convey the latter in a single beam the axis whereof has a substantially perpendicular direction with respect to the axis of said laser source.

The mentioned diffracted rays or beams impinge on a plurality of optic fibers (5) which are coupled to corresponding small holes (6), formed on the surface of a spherical bowl, 7.

The latter is mounted on a movable assembly or equipment (8), consisting of an open frame articulat-

ed on a bracket element (10) supporting the laser source and effective to swing about its pivot axis (11) as actuated by a suitable motorized kinematic assembly(12).

Moreover, the mentioned spherical bowl (7) is pivoted on the frame(9),at two diametrically opposite points whereof,and is also subjected to a swinging movement about its pivot axis, substantially perpendicular to the axis (11),as actuated by a further motorized kinematic assembly (13).

The combination of the two mentioned swinging motions,in the practice,causes the scalp to be evenly impinged upon by the electromagnetic radiations,as conveyed by the optic fibers.

Alternatively,it is possible to cause the laser source to move directly on a bowl (14) or (14'),of suitable design,by rotating along a circular guide (15) or translating along guides (16) extending on substantially circumpherential lines.

In the latter case,as it is shown in fig.6, it is possible to provide for the use of a laser source pair (1') moving along corresponding converging guides (17).

The laser source-movable equipment assembly or the laser source-bowl assembly is enclosed in a helmet member (18),of suitable shape,provided with a front portion (19) thereon there are arranged all of the controls necessary for the proper operation of the apparatus,and a display (20) is further provided

controlled by a programmable timing device.

In particular, the operation of the apparatus depends, for safety reasons, on the interruption of a light beam (21) as transmitted to a photocell, mounted on the front portion of the helmet.

Owing to that approach, as soon as the user removes the helmet, the operation of the apparatus will be prevented.

As it is illustrated in figs. 8 to 10, there is provided a small bowl helmet (30) thereon there are coupled optic fibers, indicated at (5), arranged in such a way as to simultaneously encompass all of the scalp to be treated.

In particular, the optic fibers are associated with the small helmet (30) by means of a connector (31) provided with a threaded pin (32) having a flange (33) and an axial hole (34) therein the optic fiber (5) is inserted.

The pin (32) is inserted into throughgoing holes (35) formed on the small helmet (30) and is screwed in a threaded member or bush (36) affording the possibility of better concentrating the laser beam at the desired point of the scalp.

The beams conveyed within the substantially semispheric helmet (30) are able of simultaneously irradiating all of the scalp with an incidence angle of substantially 90°.

From the above disclosure and the figures of the accompanying drawings the great functionality and use facility characterizing the radiating electromechanical

apparatus according to the present invention will be self-evident.

While a preferred embodiment of the radiating apparatus has been disclosed and illustrated, it should be noted that said embodiment is susceptible to several modifications and variations all of which come within the scope of the appended claims.

CLAIMS

1- A radiating electromechanical apparatus for treating scalp, characterized in that it comprises at least a laser source (1), the output beam whereof is diffused, offset and conveyed, either directly or through optical fibers (5), at the scalp overall extension, means being moreover provided for continuously varying the impinging points of the individual rays or beams on said scalp, in such a way as to maintain the direction of said beams perpendicular to said scalp.

2- A radiating electromechanical apparatus, according to the preceding claim, characterized in that said laser source (1) is enclosed in a box-like body(2) of tubular or flattened shape and is energized by a supply device (3), said laser source, of the helium-neon type, having its output coupled to a diffusing-offsetting member (4), effective to diffract the electromagnetic radiation in a plurality of beams.

3- An apparatus, according to claim 1, characterized in that said diffracted beams impinge on a multeplicity of optic fibers (5), coupled to corresponding small holes (6) formed on the surface of a spherical bowl (7) mounted on a movable assembly consisting of an open frame (9) articulated on a bracked element (10) supporting said laser source (1).

4- An apparatus, according to claim 1, characterized in that said frame (9) is able of swinging about its pivot axis (11) as actuated by a motorized kinematic assembly (12), said spherical bowl being

pivoted on said frame (9) at its diametrically opposite two points substantially perpendicularly with respect to said axis (11) and being also subjected to a swinging movement about its pivot axis, as actuated by a second motorized kinematic assembly (13).

5- An apparatus, according to claim 1, characterized in that said laser source (1) directly moves on a bowl (14,14') by rotating along substantially circumpherential guides (16) in which case a plurality of laser sources (2,2') being provided moving along corresponding guides (17) having converging trajectories.

6- An apparatus, according to claim 1, characterized in that the laser source(1)/movable equipment (9) assembly, or the laser source (1)/spherical bowl (14,14') assembly, are enclosed in a helmet member (18) provided with a front portion (19) thereon there are arranged all of the controls necessary for the proper operation of said apparatus and a display being provided (20) which is controlled by a programmable timing device.

7- An apparatus, according to claim 1, characterized in that its operation depends on the interruption of a light beam (21) transmitted to a photocell supported on the front portion of said helmet member (18).

8- An apparatus, according to claim 1, characterized in that it comprises a small helmet member (30) thereto there are coupled a plurality of optic fibers (5) distributed through the overall extension of the scalp to be treated, said otical fibers being coupled

to said small helmet (30) by means of a focalizing connector (31).

9- An apparatus, according to claim 8, characterized in that said focalizing connector comprises a threaded pin (32), provided with a flange (33) and an axial hole (34) for coupling to said optic fiber (5), said threaded pin (32) being effective to be inserted into holes (35) as defined through said small helmet and engaging with a member (36) provided, at the other end whereof, with a focalizing lens (37).

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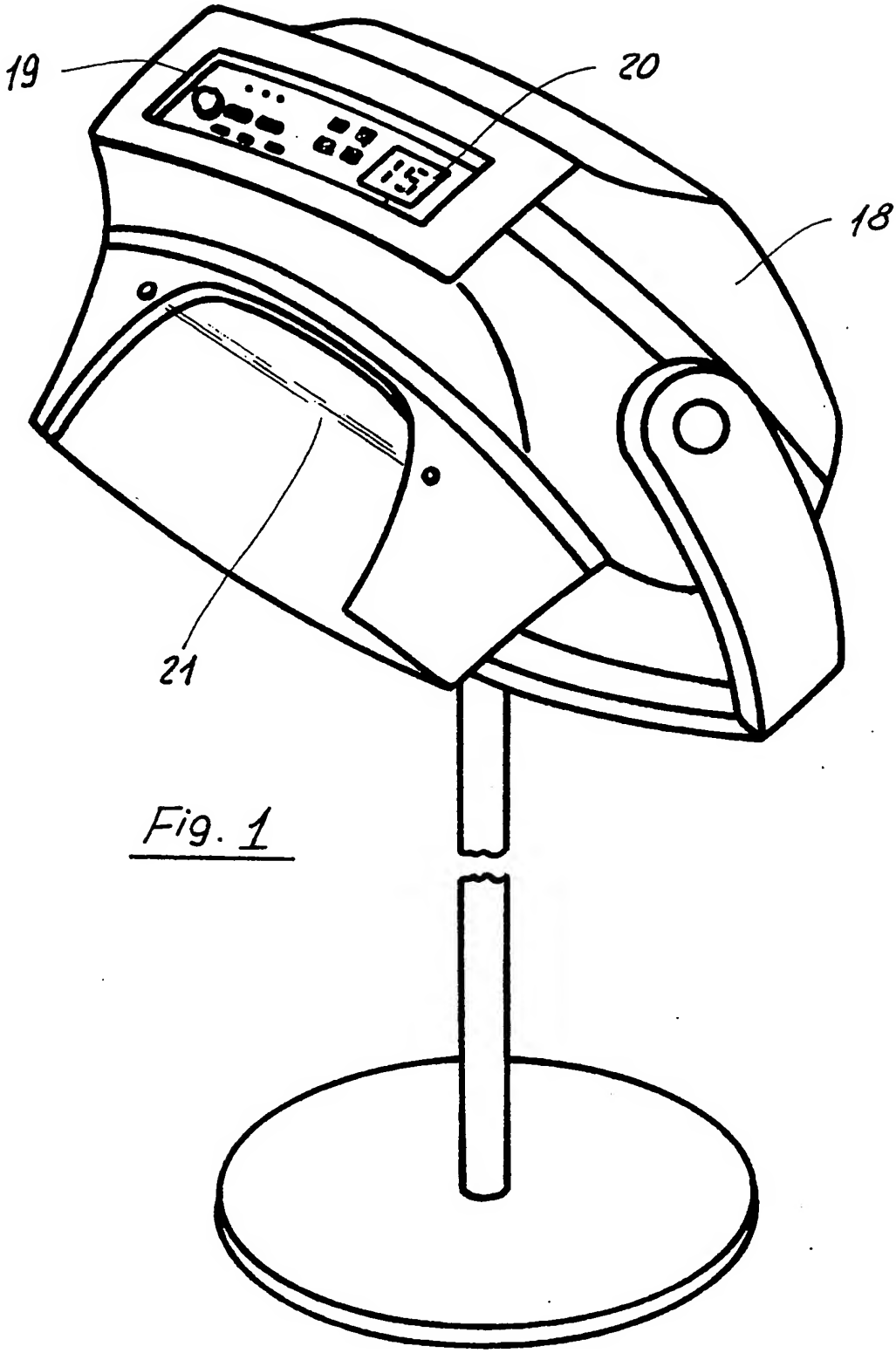

Fig. 1

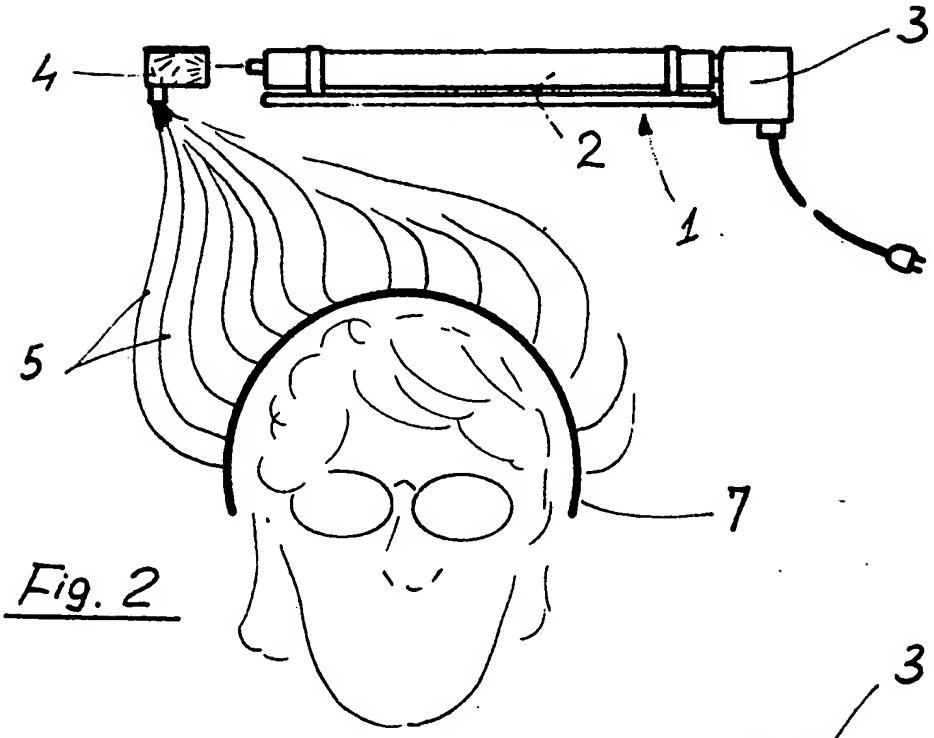

Fig. 2

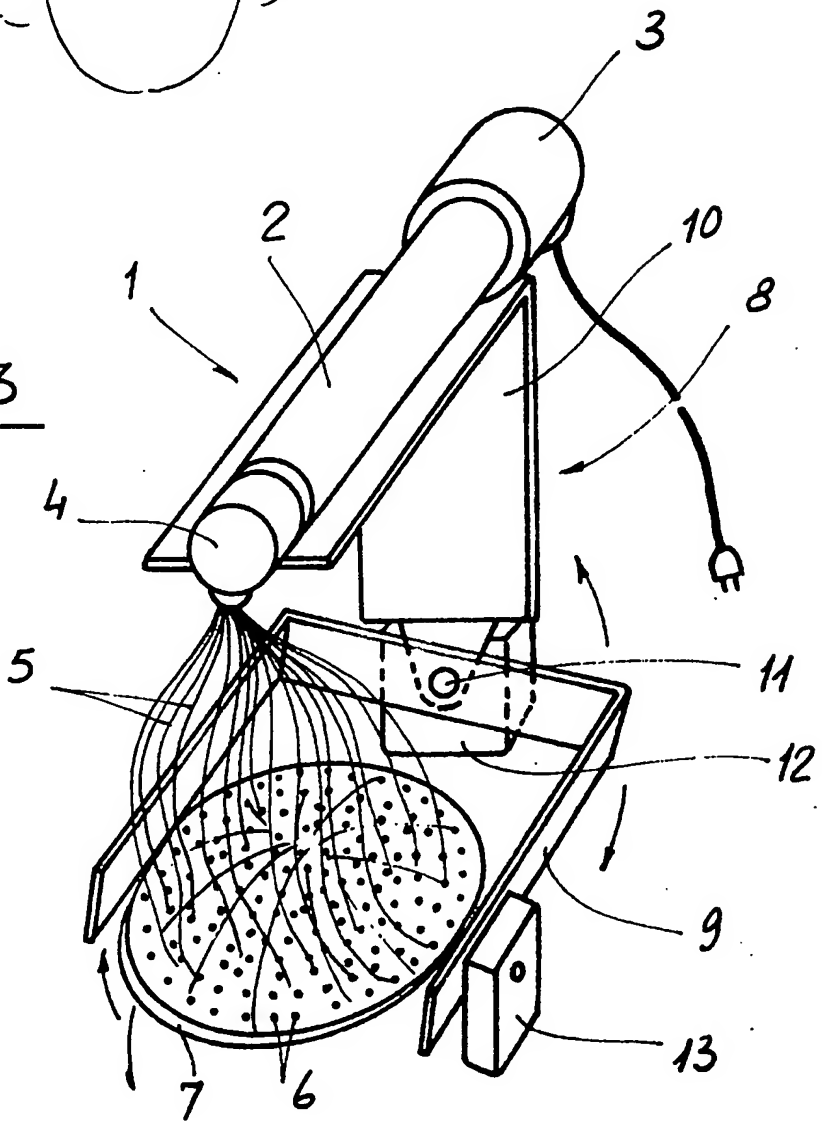

Fig. 3

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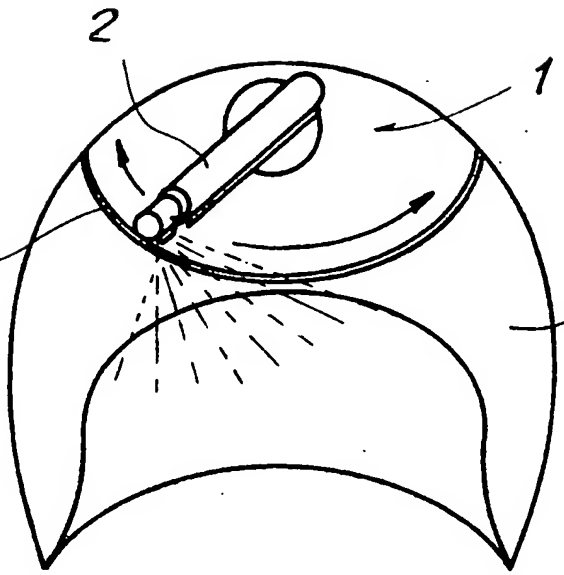

Fig. 4

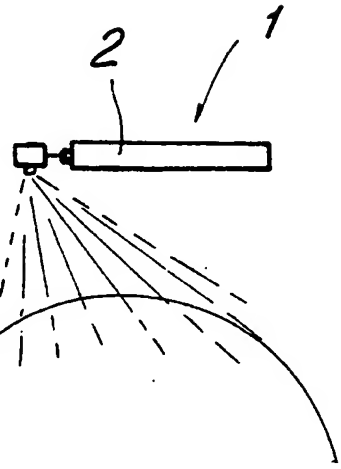

Fig. 7

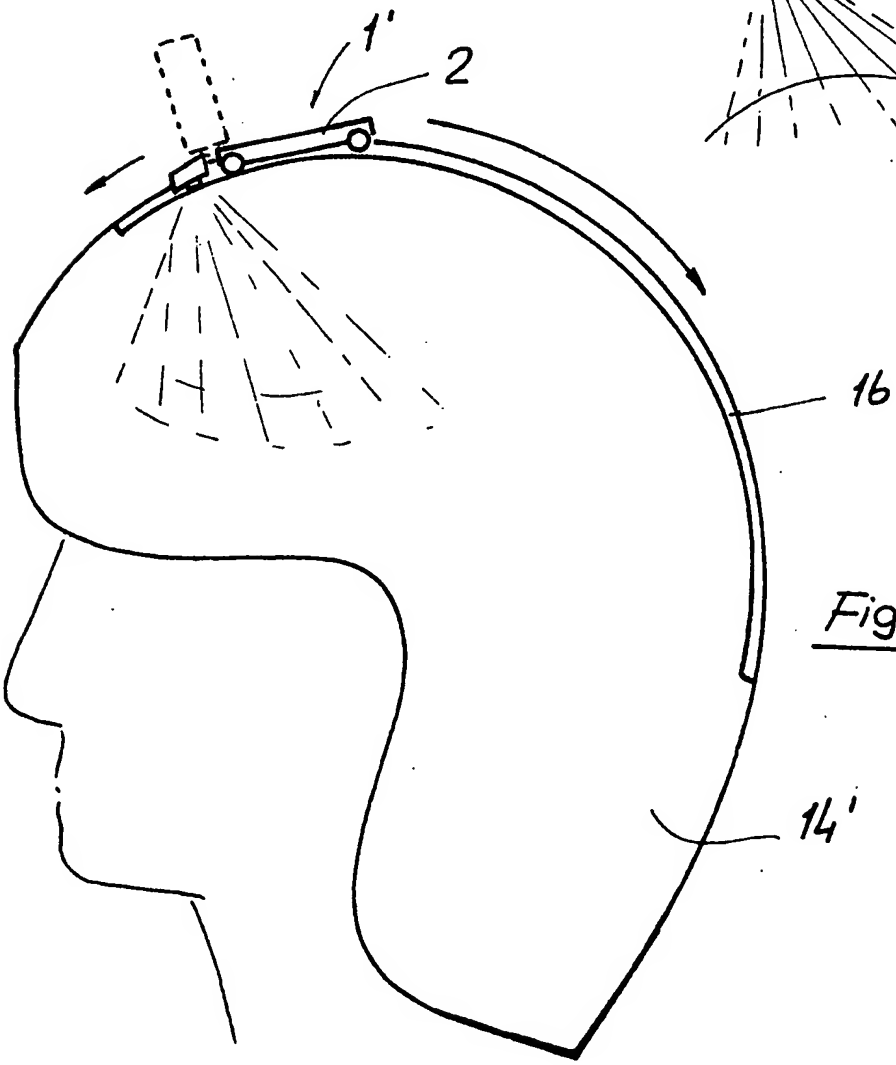

Fig. 5

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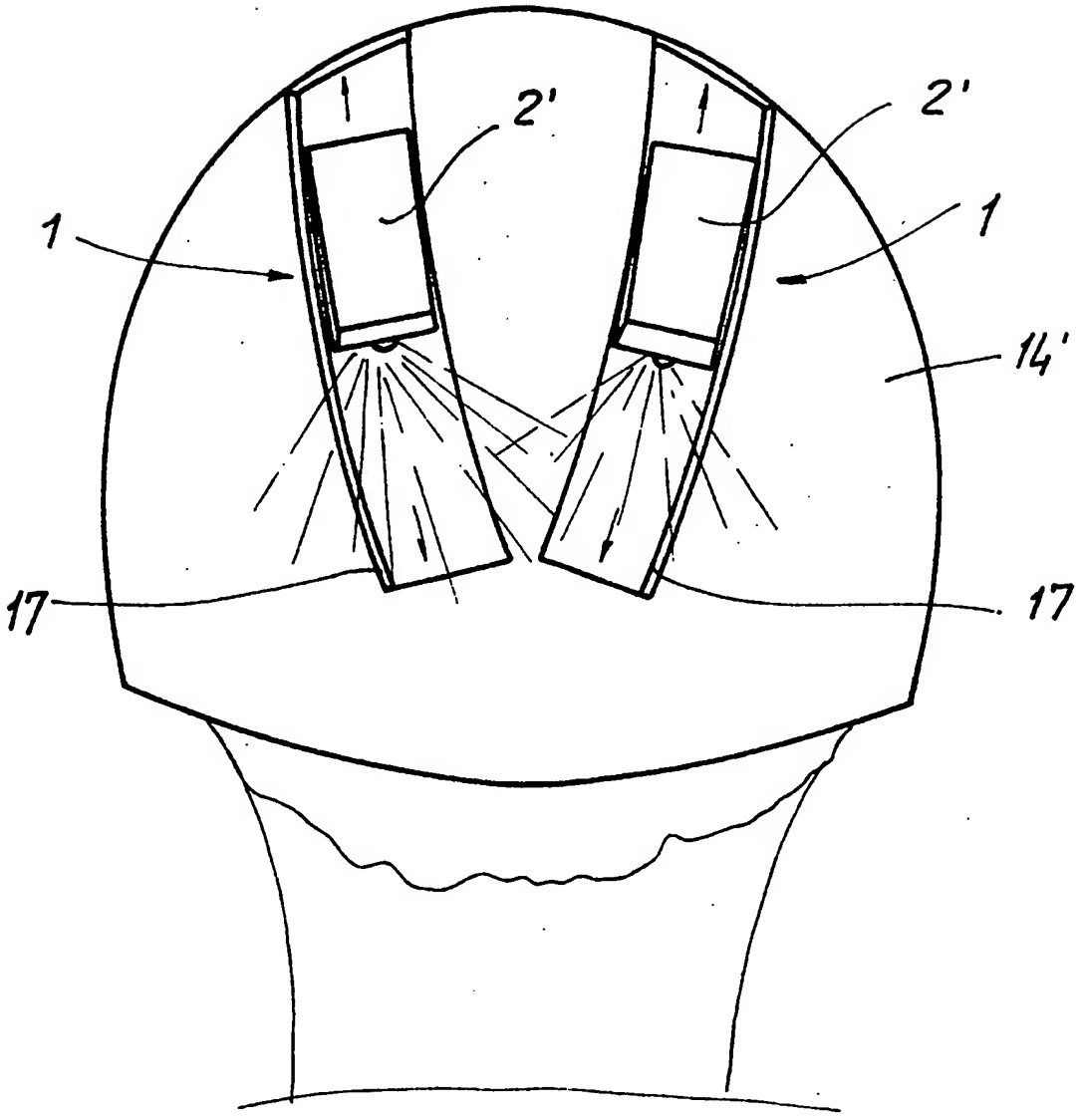

Fig. 6

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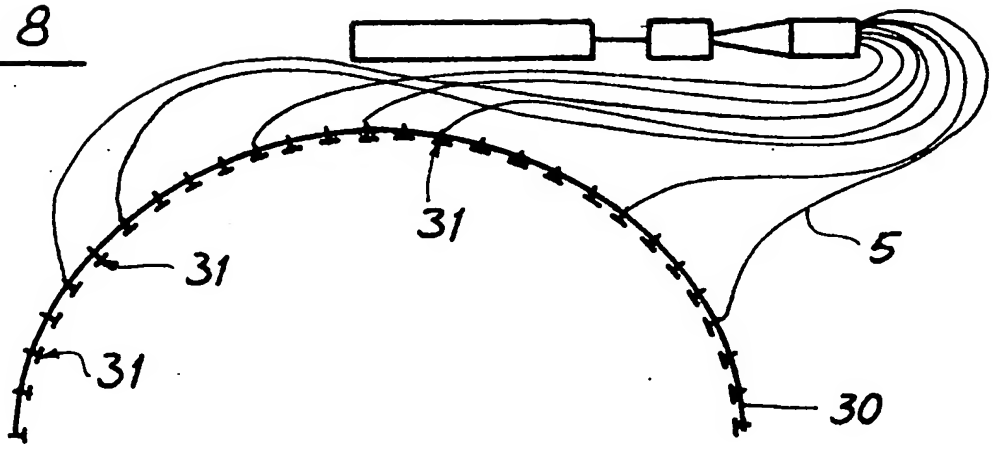
Fig. 8



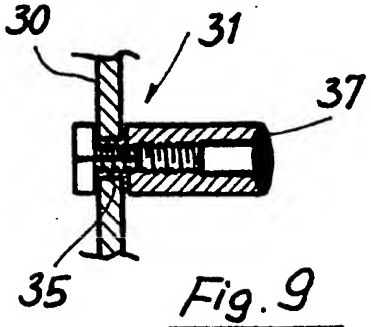


Fig. 9

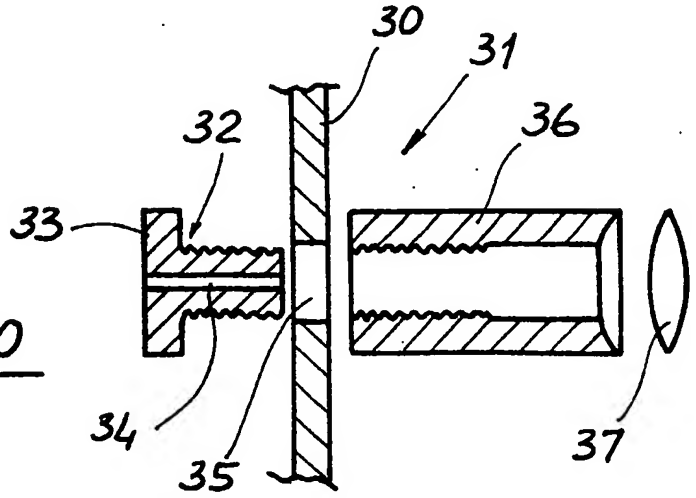


Fig. 10